



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,724	12/21/2001	David M. Dashiell	9678.00	5775

29994 7590 04/09/2003

DOUGLAS S. FOOTE
NRC CORPORATION
1700 S. PATTERSON BLVD. WHQ5E
DAYTON, OH 45479

EXAMINER

FEELY, MICHAEL J

ART UNIT	PAPER NUMBER
----------	--------------

1712

DATE MAILED: 04/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/036,724

Applicant(s)

DASHIELL, DAVID M.

Examiner

Michael J Feely

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19, 21, 23, 25, 27, 29, 31 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 10, 12, 16-18, 20, 22, 24, 26, 28, 30, 32 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Applicant is advised that should claim 10 be found allowable, claim 12 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

2. Claims 16, 17, 24, and 25 are objected to because of the following informalities: the word "dicydiandiamides" should be replaced with -dicyandiamide-. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 2, 4, 7, 11, 14, 16, 19, 21, 23, 25, 27, 29, 31, 34, and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this

Art Unit: 1712

can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites that the epoxy curing agent is solid at 20°C, followed by the recitation that the epoxy curing agent is *either* solid at 20°C *or* encapsulated in a wax or thermoplastic resin which is solid at 20°C.

Based upon the disclosure set forth on page 2, the claim should read: - wherein the epoxy curing agents, thermoplastic resins, and waxes each have a softening point below 200°C, the thermoplastic resin and waxes are solid at 20°C, and the epoxy curing agent is either solid at 20°C or encapsulated in a wax or thermoplastic resins which is solid at 20°C - .

Claims 2, 4, 7, 11, 14, 16, 19, 21, 23, 25, 27, 29, 31, 34, and 36 are rejected because they are dependent upon claim 1.

6. Claim 7 recites the limitation "30-65 wt% epoxy resin" in the composition of claim 1. There is insufficient antecedent basis for this limitation in the claim because claim 1 does not contain an epoxy resin. It appears that claim 7 should be dependent upon claim 2.

Claim Rejections - 35 USC § 102/103

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

Art Unit: 1712

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 8-12, 16-17, and 35-36 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lorenz et al. (US Pat. No. 6,149,747) and the following technical bulletins: Epon Resins and Modifiers, Physical Properties Guide or Epoxy Resins and Related Products (provided by Resolution Performance Products); and Product Data for Araldite® GT 7013 (provided by Jubail Chemical Industries Company).

Normally, only one reference should be used in making a rejection under 35 U.S.C. 102; however, a 35 U.S.C. 102 rejection over multiple references has been held to be proper when the extra references are cited to: (A) prove the primary reference contains an "enabled disclosure;" (B) explain the meaning of a term used in the primary reference; or (C) show that a characteristic not disclosed in the reference is inherent (*see MPEP 2131.01*). In the instant case, the technical bulletins are used to show that certain physical properties, namely melting point and softening point, are inherent in the cited epoxy resins and epoxy curing agents of Lorenz et al.

Regarding claims 1, 2, 4, and 16, Lorenz et al. disclose (1) and aqueous coating formulation ('747: column 7, lines 62-65) which forms a thermal transfer layer of a thermal transfer medium ('747: column 8, lines 34-39), said thermal transfer layer having

Art Unit: 1712

a softening point below 200°C ('747: column 8, lines 65-67), said coating formulation comprising: an aqueous emulsion ('747: column 7, lines 62-65) of at least one thermoplastic resin and/or wax ('747: column 5, line 49 through column 6, line 7) and at least one epoxy curing agent which initiates crosslinking with an epoxy resin ('747: column 6, lines 36-60), co-emulsified with said at least one thermoplastic and/or wax ('747: column 7, lines 62-65), wherein said aqueous emulsion comprises an aqueous liquid which does not solubilize the epoxy curing agents, thermoplastic resins or waxes ('747: column 7, lines 62-65), and wherein the epoxy curing agents ('747: column 6, lines 36-60;), thermoplastic resins, and waxes ('747: column 5, lines 65-67) each have a softening point below 200°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*), the thermoplastic resin and waxes are solid at 20°C ('747: column 5, lines 65-67), and the epoxy curing agent is either solid at 20°C or encapsulated in a wax or thermoplastic resins which is solid at 20°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*); (2) which additionally comprises an aqueous dispersion ('747: column 6, lines 62-65) of at least one epoxy resin ('747: column 6, lines 36-60) which is solid at 20°C and has a softening point below 200°C (Epon Resins and Modifiers *see Epon Resin 164: page 12*; and Product Data for Araldite® GT 7013) so as to melt mix with the epoxy curing agent at a temperature in the range of 50°C to 250°C ('747: column 8, lines 65-67); (4) which additionally comprises a sensible material dispersed therein ('747: column 5, lines 39-48); and (16) wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicyandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resin ('747: column 6, lines 50-54).

Lorenz et al. do not explicitly disclose that the wax has a softening point below 200°C; however, they disclose that the melting point of the wax is preferably from 60°C to 150°C (column 5, lines 65-67). A wax having a melting point within this range would inherently have a softening point below 200°C.

Regarding claims 3, 5, 8, and 17, Lorenz et al. disclose (3) an aqueous coating formulation ('747: column 7, lines 62-65) which forms a thermal transfer layer of a thermal transfer medium ('747: column 8, lines 34-39), said thermal transfer layer having a softening point below 200°C ('747: column 8, lines 65-67), said coating formulation comprising a combination of: a) an aqueous emulsion ('747: column 7, lines 62-65) of at least one thermoplastic resin and/or wax ('747: column 5, line 49 through column 6, line 7) co-emulsified with at least one epoxy curing agent which initiates crosslinking with an epoxy resin ('747: column 6, lines 36-60) and b) an aqueous dispersion of at least one epoxy resin ('747: column 6, lines 36-60), said aqueous coating formulation comprising an aqueous liquid which does not solubilize epoxy curing agents, thermoplastic resins, waxes, or the epoxy resins ('747: column 7, lines 62-65), wherein each of the epoxy resins ('747: column 6, lines 36-60), epoxy curing agents ('747: column 6, lines 36-60), thermoplastic resin, and waxes ('747: column 5, lines 65-67) have a softening point below 200°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*; Epon Resins and Modifiers *see Epon Resin 164: page 12*; and Product Data for Araldite® GT 7013), wherein each of the epoxy resins ('747: column 6, lines 36-60), thermoplastic resin, and waxes ('747: column 5, lines 65-67) are solid at 20°C (Epon Resins and Modifiers *see Epon Resin 164: page 12*; and Product Data for Araldite® GT 7013), and each of the epoxy curing agents are either solid at 20°C or

Art Unit: 1712

encapsulated in a thermoplastic resin or wax which is solid at 20°C (Physical Properties Guide or Epoxy Resins and Related Products *see Epi-Cure® P-101: page 26*); (5) which additionally comprises a sensible material dispersed therein ('747: column 5, lines 39-48); (8) wherein the epoxy resin is diglycidyl ether bisphenol A ('747: column 6, lines 45-48; and Product Data for Araldite® GT 7013) and the epoxy curing agent is a polyamine ('747: column 6, lines 50-54); and (17) wherein the epoxy curing agent is selected from the group consisting of polyamines, polymercaptans, dicyandiamides, carboxylic acid functionalized polyesters, phenol-formaldehyde resins and amine-formaldehyde resin ('747: column 6, lines 50-54).

Lorenz et al. do not explicitly disclose that the wax has a softening point below 200°C; however, they disclose that the melting point of the wax is preferably from 60°C to 150°C (column 5, lines 65-67). A wax having a melting point within this range would inherently have a softening point below 200°C.

Regarding claims 9-12, Lorenz et al. disclose that epoxy curing agents are heat-activated ('747: column 6, lines 48-50); however, they do not explicitly disclose that epoxy curing agent is activated to initiate crosslinking with an epoxy resin at temperatures in the range of 60°C-100°C, and that the epoxy curing agent remains active at 20°C after activation. It appears that these reactive properties would be material-specific. It has been found that if the prior art teaches the identical chemical structure, then the properties applicant discloses and/or claims are necessarily present – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Because Lorenz et al. satisfy the physical limitations of the epoxy curing agent, these properties would have been inherent in the epoxy curing agents used by Lorenz et al.

Regarding claims 35 and 36, Lorenz et al. are as set forth above and incorporated herein. Lorenz et al. teach a thermal transfer medium comprising all of the chemical components set forth in claims 18 and 19 (and claims 1 and 3); however, they are silent regarding the specific orientation and structure of the thermal transfer medium. Claims 35 and 36 are product by process claims drawn to printed matter made by the thermal transfer media of claims 18 and 19. Although Lorenz et al. do not teach the exact medium, the chemical make-up of the media of claims 18 and 19 is identical to the chemical make-up of the thermal transfer media taught by Lorenz et al. It has been found that, "Even though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process." – *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The product of the instant invention is made with same chemical components used in Lorenz et al.; therefore, it would have been the same or an obvious variation of the prior art.

Therefore, if not explicitly disclosed in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Claim Rejections - 35 USC § 103

10. Claims 6, 7, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al. (US Pat. No. 6,149,747) and the following technical bulletins: Epon Resins and Modifiers, Physical Properties Guide or Epoxy Resins and Related Products

Art Unit: 1712

(provided by Resolution Performance Products); and Product Data for Araldite® GT 7013 (provided by Jubail Chemical Industries Company).

Regarding claims 6 and 7, Lorenz et al. disclose the compositions of claims 2 and 3, which comprise from 5-50 wt% solids ('747: column 8, lines 9-13), of which 5 to 15 wt% comprises thermoplastic resin and/or wax ('747: column 8, lines 14-19), and 30-65 wt% comprises epoxy resin ('747: column 8, lines 14-19). Lorenz et al. are silent regarding the epoxy curing agent concentration of 2 to 25 wt%; however, Applicant fails to show criticality for this range.

Concentration of curing agent in epoxy systems is a result effective variable because too low of a concentration fails to yield an adequately cured product, and too high of a concentration, in excess of the stoichiometric requirement, fails to be cost-effective. It has been found that, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation," – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Regarding claims 14 and 15, Lorenz et al. fail to disclose the composition of claim 1 comprising more than one epoxy curing agent and the composition of claim 3 comprising more than one epoxy resin or more than one epoxy curing agent.

Lorenz et al. disclose the use of various epoxy resin and various epoxy curing agent ('747: column 6, lines 36-60), all of which meet the melting and softening point limitations set forth in claims 1 and 3. Each of these epoxy resins and epoxy curing agent

Art Unit: 1712

represent separate embodiments of the prior art, for the common purpose of forming a thermal transfer medium. It has been found that, "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose... The idea of combining them flows logically from their having been individually taught in the prior art." – *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). The addition of a second epoxy resin or second epoxy curing agent would have been the equivalent of combining two known embodiments of the prior art.

Therefore, it not explicitly taught in the reference, then the teachings would have been obvious to one of ordinary skill in the art at the time of the invention.

Allowable Subject Matter

11. Claims 19, 21, 23, 27, 29, 31, and 34 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
12. Claim 25 would be allowable if rewritten to overcome the objection(s) and rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
13. Claims 18, 20, 22, 26, 28, 30, 32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
14. Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome the objection(s) set forth in this office action, and

Art Unit: 1712

in independent form to include all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 18, the prior art fails to teach or suggest a thermal transfer medium having a softening point below 200°C, comprising a substrate and a single thermal transfer layer made from the composition of claim 3, wherein the epoxy curing agent is *dispersed within* the at least one thermoplastic resin and/or wax *and separated* from said epoxy resins so as to not react without melt mixing. Lorenz et al. are silent regarding the epoxy curing agent being *dispersed within* the thermoplastic resin and/or wax. Furthermore, they teach away from the concept of separating the wax/or thermoplastic resin from the epoxy resin ('747: column 7, lines 13-21).

Claims 20, 22, 24, 26, 28, 30, 32, and 33 are allowable because they are dependent upon claim 18.

Regarding claim 19, the prior art fails to teach or suggest a thermal transfer medium having a softening point below 200°C, comprising a substrate and a two layer thermal transfer material, wherein the first layer comprises an epoxy resin, and the second layer is formed from the composition of claim 1. The prior art is silent regarding this three-layer (including the substrate) system, wherein epoxy curing agent is *dispersed within* the thermoplastic and/or wax and isolated from a separate epoxy resin-containing layer.

Claims 21, 23, 25, 27, 29, 31, and 34 are allowable because they are dependent upon claim 19.

Art Unit: 1712

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson can be reached on 703-308-2340. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael J. Feely
April 7, 2003

A handwritten signature in black ink, reading "Robert A. Dawson". The signature is fluid and cursive, with the first name "Robert" being more prominent than the last name "Dawson".

Robert Dawson
Supervisory Patent Examiner
Technology Center 1700